

That which is claimed is:

1. A buoy for mooring vessels comprising:
a shell having an outer surface with a pocket defined therein, the pocket configured to maintain a fastening device below a plane of the outer surface in a direction of a midpoint of the buoy such that a vessel moored to the buoy is shielded from contact by the fastening device; and
a buoyant element retained within the shell to provide flotation.
2. The buoy as in Claim 1, further comprising a tube depending through the midpoint of the buoy, the tube configured for routing a line to anchor the buoy in a body of water, the tube made from a material configured to resist wear and tear from a movement of the line resulting from a motion of the body of water, a motion of the vessel or combinations thereof.
3. The buoy as in Claim 1, wherein the buoyant element is one of a polystyrene material, a polyurethane foam, a cork, a gas, and combinations thereof.
4. The buoy as in Claim 1, wherein the shell is made of a material selected from the group consisting of a polyethylene, a polyvinyl chloride, a rubber, a fiberglass, a nylon, an acetal plastic, a polypropylene, a polyetheretherketone and combinations thereof.
5. The buoy as in Claim 4, wherein the shell is made from polyethylene and the polyethylene is a high-density polyethylene.
6. The buoy as in Claim 1, wherein the shell is ball-shaped, can-shaped, box-shaped, pyramid-shaped, cone-shaped, drum-shaped, or combinations thereof.

7. The buoy as in Claim 1, wherein the pocket defines a wall depending downwardly in a direction of the midpoint.
8. The buoy as in Claim 7, wherein the wall is bowl-shaped and depends from about 25 degrees to about 75 degrees from a centerline of the buoy.
9. The buoy as in Claim 1, wherein the pocket is box-shaped, pyramid-shaped, funnel-shaped or combinations thereof.
10. The buoy as in Claim 1, wherein the fastening device is selected from the group consisting of a shackle, a chain, a D-ring, an O-ring, a clasp, a hook and eye apparatus, and combinations thereof.
11. The buoy as in Claim 1, wherein the fastening device is configured to swivel about a centerline of the buoy.
12. The buoy as in Claim 1, further comprising an annular lip formed on the outer surface of the shell proximate the pocket, the annular lip configured to increase a depth of the pocket to further shield the fastening device within the pocket.
13. The buoy as in Claim 1, further comprising a support plate disposed in the pocket, the fastening device and the line connected to the support plate such that an external force acting on the fastening device or the line is diffused by the support plate.
14. The buoy as in Claim 13, wherein the pocket defines a support plate pocket therein, the support plate pocket shaped complementary to the support plate to house the support plate.

15. The buoy as in Claim 1, further comprising a ballast configured to affect a buoy characteristic.
16. The buoy as in Claim 1, wherein the characteristic is upright stability, counterweight or combinations thereof.
17. The buoy as in Claim 1, further comprising a line to anchor the buoy in the body of water.
18. A mooring device for a buoy comprising:
 - a shackle for attaching a mooring line from a vessel;
 - a pocket defined in a surface of a buoy to retain the shackle below the surface in a direction of a midpoint of the buoy such that a hull of the vessel moored to the buoy is shielded from contact by the shackle; and
 - a protrusion disposed proximate the pocket depending from the surface of the buoy in a direction away from the midpoint, the protrusion configured to increase a size of the pocket such that the shackle is further removed from the surface of the buoy, the protrusion further configured to make contact with the vessel in lieu of the shackle.
19. The mooring device as in Claim 18, wherein the shackle is configured to swivel about a centerline of the buoy.
20. The mooring device as in Claim 18, wherein a distal end of the shackle terminates beneath an outermost edge of the protrusion.
21. The mooring device as in Claim 18, wherein the pocket is bowl-shaped, box-shaped, funnel-shaped or combinations thereof.

22. The mooring device as in Claim 18, wherein the surface of the buoy is made of a material selected from the group consisting of a polypropylene, a polyethylene, a polyvinyl chloride, a rubber, a fiberglass, a wood and combinations thereof.
23. The mooring device as in Claim 18, wherein the protrusion is a collar affixed to the surface.
24. The mooring device as in Claim 18, further comprising a buoyant element disposed beneath the surface of the buoy, the buoyant element selected from the group consisting of a polystyrene material, a polyurethane foam, a cork, a gas, and combinations thereof.
25. The mooring device as in Claim 18, further comprising a support plate disposed in the pocket, the support plate connected to the shackle and to an anchor chain for anchoring the buoy in a body of water.
26. The mooring device as in Claim 25, wherein the pocket defines a support plate pocket therein, the support plate pocket shaped complementary to the support plate to house the support plate.
27. A method of manufacturing a buoy, comprising the steps of:
forming a shell defining a shackle pocket therein;
bonding a tube within the shell;
inserting a buoyant element into the shell and about the tube; and
attaching a shackle within the shackle pocket such that the shackle is disposed beneath a surface of the shell.

28. The method as in Claim 27, wherein the shell is formed by rotational molding, blow molding, or injection molding.
29. The method as in Claim 27, further comprising the steps of forming the buoyant element, placing the formed buoyant element about the tube, and forming the shell about the buoyant element and tube for encapsulation by the shell.
30. The method as in Claim 27, further comprising the step of injecting the buoyant element into the formed shell.
31. The method as in Claim 30, further comprising the step of hardening the buoyant element about the tube in the formed shell.
32. The method as in Claim 27, further comprising the step of attaching a support plate in the shackle pocket, the shackle attached to the support plate.
33. The method as in Claim 27, further comprising the step of attaching an anchor chain, a dead weight, an anchor or combinations thereof to the buoy.
34. The method as in Claim 27, further comprising the step of adding ballast to the buoy.
35. The method as in Claim 27, further comprising the step of forming a lip on the shell proximate the shackle pocket, the lip configured to shield a vessel from the shackle.
36. The method as in Claim 27, further comprising the step of attaching a lip on the shell proximate the shackle pocket after formation of the shell, the lip configured to shield a vessel from the shackle.

37. A processing line for manufacturing a mooring buoy according to Claim 1, the processing line comprising:
 - means for forming a buoy shell defining a shackle pocket therein;
 - means for bonding a tube within the buoy shell;
 - means for inserting a buoyant element into the shell and about the tube; and
 - means for attaching a shackle within the shackle pocket such that the shackle is disposed beneath a surface of the buoy shell.